SUCCESS WITH MATH™

Quadratic Equations
User's Manual
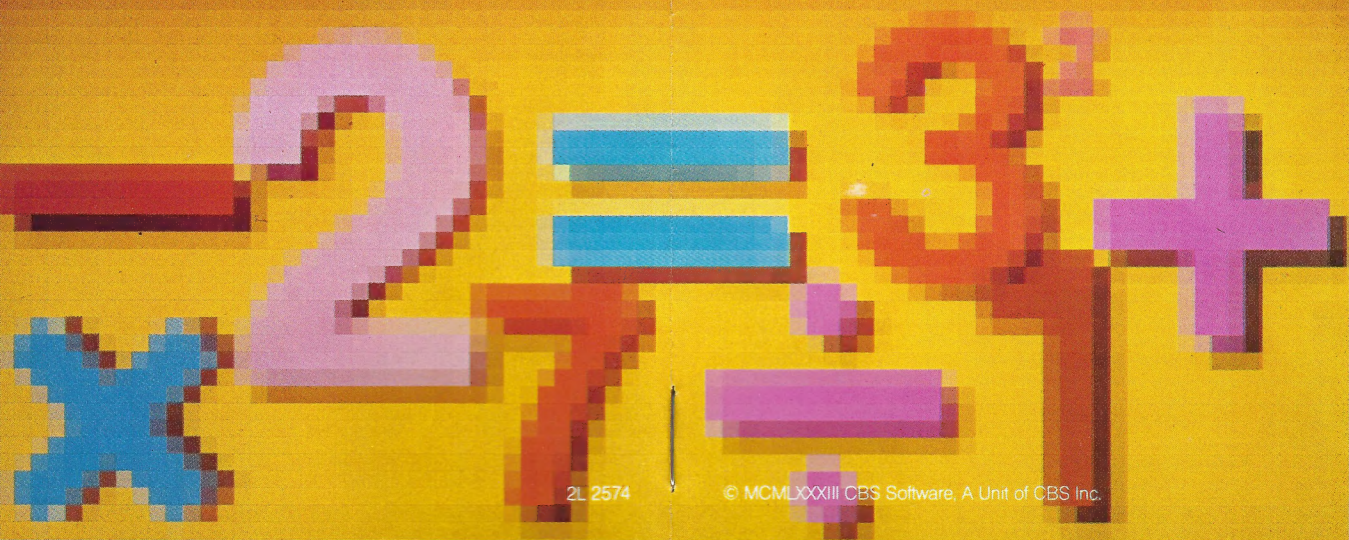
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Setting up your Computer

For Disk:

1. Following manufacturer's instructions, hook up your computer and disk drive to a monitor or TV.

2. Insert the program disk into the disk drive and close the drive door.

3. Turn your computer and monitor on.

4. Turn down the volume on your monitor.

5. If your disk drive does not automatically boot disks, follow manufacturer's instructions for booting the disk.

For Cassette:

1. Following manufacturer's instructions, hook up your computer and program recorder to a monitor or TV.

2. Insert the program cassette into the program recorder following cassette label instructions.

3. Turn your computer and monitor on.

4. Turn down the volume on your monitor.

5. Load the program into the computer following manufacturer's instructions.

Program Objective

This SUCCESS WITH MATH™ program provides comprehensive drill and practice solving quadratic equations utilizing the factoring process. An understanding of factoring is emphasized along with procedures for setting each factor equal to zero and solving as separate equations. Once the program has been loaded into the computer, the program itself will take over and instruct the user how to proceed.

Program Description

All equations in the program are randomly generated in the form

$$AX^2 + BX + C = 0$$

where A, B, and C are integers. User may choose between two levels of difficulty. For easier problems, the coefficient of the quadratic term (A) will always be 1. More difficult equations will have a quadratic coefficient of 2 or 3.

The screen is divided into three sections: original equation, work area and message/instruction area. When each new equation is presented, the message/instruction area will contain a main menu having three options. For example:

Solve: $X^2 - 3X - 10 = 0$
Work Area:

ENTER ONE OF THE FOLLOWING:
1) DIVIDE BOTH SIDES BY A NUMBER
2) FACTOR THE LEFT SIDE
3) SET EACH FACTOR EQUAL TO ZERO AND SOLVE

If the integers A, B and C have a common factor, the user must first choose option 1. User will then be asked to enter the number to be divided into each term. The equation will then be simplified to reflect the results of the division.

After the equation is simplified or, as in our example, the integers A, B and C do not have a common factor, the user must choose option 2. User will then be asked to enter the correct factors in the work area, one at a time. If the user enters incorrect factors, an error message will appear along with the product of the incorrect factors. This will illustrate to the user why the answer was wrong. The user may then try a new pair of factors. If a second error is made, the program will automatically branch to a tutorial section that explains in detail how to factor the quadratic expression.

After the correct factors have been entered, the main menu will reappear. The user must then select option 3 to set each factor to zero and solve. A new menu containing the rules required for solving equations will appear and our screen will now look like this:

Solve: $X^2 - 3X - 10 = 0$
Work Area: $(X - 5) = 0$ $(X + 2) = 0$

ENTER ONE OF THE FOLLOWING:
1) ADD THE SAME NUMBER TO BOTH SIDES
2) SUBTRACT THE SAME NUMBER FROM BOTH SIDES
3) MULTIPLY BOTH SIDES BY THE SAME NUMBER
4) DIVIDE BOTH SIDES BY THE SAME NUMBER

Using these rules, the user solves for X in each equation, step by step:

Solve: $X^2 - 3X - 10 = 0$

$$\begin{array}{llll} \text{Work Area:} & (X - 5) = 0 & (X + 2) = & 0 \\ & \underline{+5 \ +5} & \underline{-2 \quad -2} \\ & X \quad = 5 & X \quad = -2 \end{array}$$

THAT IS CORRECT.
THESE ARE THE SOLUTIONS TO THE EQUATION.

All errors are immediately called out *and explained*. The user may then try a new answer. Errors are divided into two categories: procedural and computational. Procedural errors involve the incorrect use of a rule. Computational errors involve a mistake in calculation. The program tracks type and number of errors made and displays the totals on the screen after the solution is reached.

It is important to note that the user must enter the correct answer for each step before the program will continue on to the next step in the solving process. The user always succeeds in solving the equation and knows exactly where errors have been made.

Other programs in the Success With Math™ series from CBS Software:

Addition and Subtraction—Grade Levels 1 to 4
Multiplication and Division—Grade Levels 2 to 8
Linear Equations—Grade Levels 7 to 11